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ABSTRACT

This document reviews information and research findings regarding various options to facilitate the full inclusion of students with disabilities. Principles of inclusive schools introduce the document. Three categories of strategies and interventions for working with students with disabilities are included: (1) program strategies, (2) classroom grouping schemes, and (3) teaching methods and procedures. The following program strategies are addressed: educational support teams, consultation, curriculum based assessment, the Adaptive Learning Environments Model, and Project RIDE (Great Falls, Montana). Four options for classroom grouping schemes considered are: peer and cross-age tutoring, cooperative learning, ability grouping, and reducing class size. Specific teaching methods and practices presented are: reciprocal teaching, social skills training, study skills training, instructional reinforcement, learning styles, mastery learning, and effective teaching strategies. Within each category and subsumed intervention, a common format is used which includes a definition of the intervention, a summary of the major research findings, details of some specific research, and consideration of the quality of the research. References are provided for each intervention. (DB)

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Organizational, Instructional and Curricular Strategies to Support the Implementation of Unified, Coordinated, and Inclusive Schools

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ORGANIZATIONAL, INSTRUCTIONAL, AND CURRICULAR STRATEGIES TO SUPPORT THE IMPLEMENTATION OF UNIFIED, COORDINATED, AND INCLUSIVE SCHOOLS

Introduction

Within the context of overall school restructuring, school systems and states across the nation are planning and implementing efforts that are embracing the concept of serving all children within more unified, coordinated, and inclusive schools. Following are some of the features of schools that serve all children:

- Students are included--rather than just mainstreamed.
- Students work in more flexible learning environments--with flexible curriculum and instruction.
- All students work toward the same overall educational outcomes--what differs is the level at which these outcomes are achieved and the degree of emphasis placed on them.
- Attitudes and values within the school celebrate diversity; promote accountability, multi-culturalism, and professional collaboration; values the strengthening of social relationships among children; and explores strategies for pursuing excellence without sacrificing equity.
- Curricula is developmentally appropriate and accessible to all students.
- An array of services are provided that are coordinated across educational and community-agency personnel.
- There is a sense of community that values the abilities and limitations of all students and provides opportunities for students to develop a strong sense of self worth, concern, and respect for others; as well as the ability to work inter-dependently.
- All teachers work together to solve problems related to maximizing the learning of all students.
- Many strategies are implemented to support a unified, coordinated, and inclusive school--cooperative learning, curriculum adaptation, peer-mediated learning approaches, collaborative and team teaching, direct instruction,

reciprocal teaching, etc.

- New forms of accountability and assessment will be developed and implemented.
- Parents are embraced as equal partners.
- Even though full inclusion is a goal, a continuum of educational options is present to provide choice and to meet the individual needs of each child--coordination is emphasized within each option.

Schools that are moving toward more unified, coordinated, and inclusive programs are in various stages of planning and developing the above and other features. Change takes time. Sufficient time must be provided to plan, implement, evaluate, and internalize program refinements. Those who will implement the change (classroom teachers and other support staff) and those who will be impacted by the change (parents and students) must determine the type of change needed and must be involved in the planning and implementation of selected strategies to meet the needs of their school. A single change model should not be imposed. Rather, organizational, instructional, and curricular strategies will vary building by building, based on the needs of the students within the school and based on available organizational, human, and fiscal resources within the school.

Purpose of Document

The purpose of this document is to provide information and research findings regarding a menu of options that can facilitate unified, coordinated and more inclusive schools. Three categories of strategies and interventions for working with students with disabilities are included:

Program Strategies
Classroom Grouping Schemes
Teaching Methods and Procedures

Program Strategies

With sufficient guidance at the policy and administrative level, strategies for educating students with disabilities and special needs can be formulated. This document will focus on the following program strategies:

Educational Support Teams
Consultation
Curriculum Based Assessment
ALEM
Project RIDE

Classroom Grouping Schemes

Variations in the organization of the classroom which are not necessarily instructional in nature can effect student learning. Decisions as to how the classroom is structured may be made in response to school or district policy, or by the teacher in conjunction with a planned instructional approach. Four options are included within this document:

Peer and Cross-Age Tutoring
Cooperative Learning
Ability Grouping
Reducing Class Size

Teaching Methods and Practices

Interactions between teacher and student are the focus of this category. This document includes four approaches that may be used in more than one of the more general classroom grouping schemes or placement strategies noted above.

Reciprocal Teaching
Social Skills Training
Study Skills Training
Instructional Reinforcement
Learning Styles
Mastery Learning
Effective Teaching Strategies

Within each category and subsumed intervention, a common format will be used. The literature review of each category and subsumed interventions will follow a common structure. Each will begin with a definition of the intervention as provided in practice and by the literature. The extent of discussion will vary, providing an overall description as well as common variations, when appropriate. Following this, a brief summary of the major findings of the body of research will be presented. Then, more specific details of specific research which include these findings will be described. Finally, for several options, information will follow that discusses the quality of the research, often a major point of discussion in scholarly research reviews. When methodological issues are raised in the literature, they were included in this section; if no serious questions were raised, this section is omitted.

Some of the research is characterized by conditional findings. Where appropriate, the discussion attempts to clearly explicate those conditions.

Note:

Before proceeding, the author would like to emphasize that this document contains only a sampling of the many organizational, instructional, and curricular strategies that schools are implementing. It is a document "in progress; e.g., other strategies and options to support the implementation of inclusive, coordinated, and more inclusive schools will be added.

In addition to a review of many studies, program descriptions, books, and documents, the writer has also utilized several sources that provide similar information about the myriad of options and strategies. These sources include:

Ammerican Association of School Administrators American Association of School Administrators (AASA) (1991). **Learning Styles: Putting Research and Common Sense into Practice.** Arlington, Va: AASA.

Cotton, K. **Summary of Research on Class Size, School Improvement Research Series.** Portland, Oregon: Northwest Regional Educational Laboratory.

Cotton, K. **Instructional Reinforcement, School Improvement Research Series.** Portland, Oregon: Northwest Regional Educational Laboratory.

Gabriel, R., Paule, L., and Olson, T. ((1989). **The effectiveness of alternative instructional interventions for Washington's low performing and mildly handicapped students. Final report prepared for the State of Washington, Office of Superintendent of Public Instruction,** Portland, OR: Northwest Regional Educational Laboratory.

Hofmeister, A. and Lubke, M. (1990). **Research into practice: Implementing effective teaching strategies.** Boston, MA: Allyn and Bacon.

Research Triangle Institute. (1991). **A resource guide for integrating students with disabilities into general education programs.** Research Triangle Park, North Carolina.

Slavin, R.E. (1986). **Ability grouping and student achievement in elementary schools: A best-evidence synthesis.** Baltimore, Md: Center for Research on Elementary and Middle Schools.

EDUCATIONAL SUPPORT TEAMS

Educational support teams have been implemented in a number of school systems across the country using a number of different names, including building assistance teams. Educational support teams is a building-level system that provides assistance to teachers in meeting the needs of all students in their classrooms. The most common approach is based on the Teacher Assistance Team concept developed by James Chalfant and Margaret Pysh, University of Arizona. The development, organization, and utilization of an Educational Support Team such as a Teacher Assistance Team is to achieve two major objectives: to determine specific problems that students are experiencing and to help teachers establish successful instructional and/or behavioral programs for children with learning and/or behavior problems within regular education classrooms.

As Educational Support Team is a team of teachers, is building based, jointly engages in problem solving, and provides support and follow-up. The purposes are:

- to deal with teachers' individual and immediate classroom concerns;
- to give teachers more ideas and support in dealing with problematic students and situations;
- to support teachers with the mainstreaming of students with disabilities; and
- to provide collaboration strategies for all teachers to meet the needs of all students.

An Educational Support Team is not a referral team, an assessment team, or a placement team. Educational Support Teams are typically composed of three or four general classroom teachers, elected by the faculty, who meet weekly to provide problem-solving assistance to other teachers. The Educational Support Team deals with the individual and immediate classroom concerns of other teachers. The teacher seeking assistance defines the problem, selects from alternative interventions developed jointly by the Team and the teacher requesting assistance, and decides on their effectiveness. Educational Support Teams are based on the belief that teachers have a vast knowledge and talent that often is not shared with others, and creates a forum for allowing professional educators to share problems and solve them. These Teams are also based on the principle that teachers can solve more problems working together than alone. Teachers value immediate help with a problem and learn by doing. Attached are two charts that show how an Educational

Support Team works, as well as to delineate what happens at the building assistance team meeting.

There are several benefits of using an Educational Support Team: a greater number of students receive assistance, there is a greater understanding of children with learning problems, collaboration results in a greater variety of instructional strategies, teachers are more confident, and there is greater access and use of support staff.

Major Findings

- Although Educational Support Teams have been widely implemented in school districts across the country, there is limited evidence on their effectiveness.

- Based on teacher judgement, Chalfant and Pysh (1981) have reported an 88.7 percent student success rate in terms of goals related to work habits, classroom behavior, interpersonal behavior, and attention to tasks.

- Educational Support Teams have reduced special education referral and identification rates.

- Positive teacher satisfaction has been reported with the use of Educational Support Teams.

The Research

- Chalfant and Pysh have summarized the results from five descriptive studies on 96 first-year teams. Independent evaluations have been reported by Graden, Sasey, and Bonstrom (1985) and Harrington and Gibson (1986).

- Chalfant and Pysh (1981) reported a 88.7 percent student success rate for general education students, and Gilmer (1985) reported a 72 percent success rates; e.g., students achieving nearly all of their intervention goals. In two additional studies, teachers and team members who reported the success of the intervention generated by the Teacher Assistance Team found that 44 percent of the students were making great and considerable progress, 35 percent were making moderate progress, and 24 percent were making little or no progress (Chalfant and Pysh, 1985, 1988).

- In three Chalfant and Pysh studies, 21 percent of 386 students who received Teacher Assistance Team assistance were referred to special education, 93 percent were found eligible. Other studies have found that implementation of Teacher Assistance Teams significantly reduces special educational referral rates. For example, Talley (1988)

reported a 65 percent drop in referral rates. Graden, et a. (1985) found reduced referral rates in four schools that implemented Teacher Assistance Teams.

- In 1985, Chalfant and Pysh surveyed teachers regarding their satisfaction with Teacher Assistance Teams implemented in their buildings and found that 88 percent were positive; 14 percent did express concerns such as insufficient time for meetings, failure to generate useful strategies, and interference with the special education referral process. In another study, 48 percent of 23 Teacher Assistance Teams felt that they were moderately successful, and 26 percent felt they were occasionally effective.

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CONSULTATION

Consulting programs and strategies are designed to facilitate collaboration across and among all school personnel, as well as health and human service personnel, to meet the needs of students with special needs. Consultation is defined as "an interactive process that enables people with diverse expertise to generate creative solutions to mutually defined problems" (Idol, Paolucii-Whitcomb, & Nevin, 1986).

The success of consulting programs rests on at least three areas: careful and cooperative development of strategies to be used Huefner, 1988); effective communication (Reisberg & Wolf, 1986; Want, 1987); problem solving skills (Conoley & Conoley, 1982); and appropriate assessment and use of instructional strategies (Heron & Harris, 1987; Idol, Paolucci-Whitcomb, & Nevin, 1986).

Co-teaching, coaching, and the use of consulting teachers who provide direct and indirect assistance to regular classroom teachers are examples of consultation programs that have been effectively implemented in many school systems. Essential steps in the coaching process involve the target teacher's observation of the method to be used as demonstrated by an "expert" practice of the method with feedback, and coaching in the real teaching situation.

Co-teaching pairs a regular classroom teacher with a special education teacher to co-teach regular content courses. Two teachers, with different viewpoints and goals for learning, provide a richer mix for the teachers and the students and enable closer and easier involvement with students. Co-teaching makes the course content available to all students. Team teaching is another form of consultation in which teachers are paired to teach the curriculum content as well as to deal with the unique abilities and needs of individual students. A major issue in effective team work is to define the leader and supporter for specific situations.

Major Findings

- Research on consultation has produced encouraging results. Various meta-analyses of consultation studies (Mannino & Shore, 1975; Medway, 1982; West & Idol, 1987); Medway and Updyke, 1985) have revealed a clear positive effect of consultation.

- Bergan (1977) has identified the important stages of the consultative process--problem identification, problem analysis, plan implementation, and problem evaluation.

The Research/References

Bergan, J.E. (1977). **Behavioral consultation.** Columbus, OH: Merrill.

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CURRICULUM-BASED ASSESSMENT

Curriculum-based assessment (CBA) is an approach for continuously measuring achievement of students' proficiency in basic school skills. CBA procedures allow for data collected to be curriculum-referenced, individually- referenced, and peer-referenced. Data can then be used for making special education programming decisions. Use of CBA has been studied at the University of Oregon (Tindal, 1985) and at the University of Minnesota (Deno, 1985).

Curriculum-based assessment is a procedure for determining the instructional needs of a student based upon objective assessment of the student's ongoing performance within existing course content. It measures the level of achievement of a given student and charts the student's progress in terms of the expected curricular outcomes of the school.

Major Findings

In reviews of the research literature conducted by Tindal (1985) and Deno (1985), the major findings on the use of CBA include:

- Measures obtained from using curriculum-based assessment are:
  - reliable and valid;
  - highly sensitive to student growth;
  - more sensitive to improvement in student achievement than standardized achievement tests; and
  - are able to be aggregated across students to evaluate overall program effects.

The Research

Research has been conducted on the development and utility of CBA. A sampler of the findings include:

1. Time and cost efficient measures of student growth were identified in areas of reading, spelling, and written expression (Deno, Murkin, & Chiang, 1982).

2. Measures are highly reliable and demonstrate content, criterion-related, and construct validity (Tindal, Marston, & Deno, 1983).

3. Measures are highly sensitive to growth under short-term treatments (Marston, Lowry, Deno, & Mirken, 1981; Deno, Marston, Mirken, Lowry, Sindeler, & Jenkins, 1982).

4. Measures are more sensitive to improvement in student achievement than standardized achievement tests (Marston & Deno, 1982).

5. Data derived from individual students can be aggregated to evaluate overall program effects and system-level changes (Germann & Tindal, 1985).

References

Deno, Stanley L. 1985. Curriculum-based measurement: The emerging alternative. **Exceptional Children** 52(3) (November):219-232.

Deno, Stanley L., P. R. Mirkin. and B. Chiang. 1982. Identifying valid measures of reading. **Exceptional Children** 49(1):36-45.

Tindal, Gerald. 1985. **Pre-assessment consultation-intervention: enhancing instructional options in regular education classrooms**. Eugene, Oregon: University of Oregon.

Quality of the Research

Reviews of the research of CBA have produced some controversy about its utility for making school-level decisions. Lack of agreement regarding essential knowledge and skills to be required of all students precludes development of standardized curriculum-based measures. Data obtained from ad hoc CBA measures are primarily useful in making criterion-referenced instructional decisions; however, when used in this way, the technical adequacy of ad hoc CBA data is questionable. Unless a school adapts uniform curricula, CBA data cannot be aggregated across students, teachers, and programs for purposes of making evaluation decisions.

ADAPTIVE LEARNING ENVIRONMENTS MODEL (ALEM)
Developed by Margaret C. Wang

The overall goal of the Adaptive Learning Environment Model (ALEM) is to create school learning environments in which each student can acquire basic academic skills while becoming more confident in his or her ability to learn and to cope with the social and physical demands of the classroom environment. This is accomplished through the combination of distinct, yet complementary, learning components. The first is a highly structured prescriptive learning component which uses built-in diagnostic procedures that are part of effective teaching of basic academic skills. The second learning component uses open-ended exploratory learning approaches considered to be conducive to the promotion of inquiry as well as social and personal development in the planning and management of learning.

The ALEM is an instructional program that facilitates individualization of instruction that accommodates a wide range of student characteristics and needs in regular classroom settings. In addition to a comprehensive individualized instructional system that adapts instruction to the needs of individual students, the ALEM had a built-in support system to facilitate implementation of the instructional program through the involvement of school administrative and instructional support personnel, health professionals, and families; and the use of a "full-time" rather than a "shared-time" approach to providing for the "special education" needs of regular and exceptional students.

The ALEM was developed in the late 1960s at the Learning Research Development Center of the University of Pittsburgh (Wang, 1980). It combines prescriptive or direct instruction with aspects of informal or open education that are considered to be conducive to generating attitudes and processes of inquiry, self-management, responsibility for learning, and social cooperation (Johnson, Maruyama, Johnson, Nelson, & Skoan, 1981; Marshall, 1981; Peterson, 196-79; Wang, 1983; Wang & Stiles, 1976). All students are expected to reach the following goals:

- Acquire basic academic skills.
- Interact appropriately with peers and develop social competence and self-esteem.
- Take responsibility for his/her own learning and behavior by participating in the planning and management of

his/her educational tasks.

In a typical ALEM classroom, student can be found working in every area of the classroom, either in small groups or individually, at any given time. Teachers circulate among the students to provide instruction and evaluation feedback on an individual or a small-group basis, as needed. Academic skills ar taught directly, based on diagnostic test results, and every student is expected to make steady progress through the curricula. Learning tasks are broken down into incremental steps, providing frequent opportunities for evaluation. Each student's successes are recognized, momentary difficulties are pinpointed, and alternative instruction is provided before the difficulties can become learning problems. Student responsibility is emphasized. Students are taught to plan and monitor their own learning. They are expected to take responsibility for planning, managing, and completing all their teacher-prescribed and self-selected learning tasks within the time limits jointly agreed upon with the teacher (M. Wang).

The Adaptive Instruction component of the ALEM has the following features: individualized progress plans tailored to each students; a diagnostic-prescriptive monitoring system that ensures that each student is assigned appropriate educational tasks; and a self-schedule system whereby students are taught to take responsibility for scheduling their own work. The Alem has 12 critical dimensions or design features:

- Arranging space and facilities to foster and permit students' independence and responsibility for managing their learning behavior.
- Creating and maintaining instructional materials for each objective of the learning sequences for the various curricula in the program--with both prescriptive and exploratory activities.
- Establishing and communicating rules and procedures to permit independent management of their learning environment and activities.
- Managing aides to facilitate learning and monitoring of student performance.
- Record keeping to record progress of the student in daily prescriptive tasks.
- Diagnostic testing before they enter a new unit of instruction or when teachers feel a re-evaluation is necessary.
- Prescribing based on test results and information from informal observations.
- Monitoring and diagnosing to facilitate learning.
- Interactive teaching with teachers continuously moving about in all areas of the classroom to assist students.
- Instructing in new tasks in small groups, individually, and/or to the whole class.
- Motivating both verbally and nonverbally to encourage

self-management skills, independence, and peer cooperation.

- Developing student self-responsibility.

Major Findings:

- ALEM students have scored above estimated population norms for students from low-income families, as well as above the national norms established by the standardized tests.

- Positive attitudinal trends have been found in ALEM classrooms where exceptional (both gifted and disabled) students are integrated with non-exceptional students in regular classroom settings on the full-time basis.

- ALEM students also had reduced perceptions of differences.

- ALEM has generally been shown to be cost effective.

- The ALEM has also been shown to effectively establish and maintain learning environments which are adaptive to the diverse needs of individual students.

- The ALEM has also resulted in high rates of time-on-task and increased instructional interactions with teachers.

The Research

- A number of studies support both the feasibility and effectiveness of adaptive instruction programs. Wexman et al. (cited in Wang & Zollers, 1990) conducted a meta-analysis of 38 empirical studies of programs that used the adaptive instruction approach. The data base involved a total sample of approximately 7,200 students. The authors indicated that the average score of students under the adaptive instruction programs was at the 67th percentile of the control group distribution. This overall positive effect of adaptive instruction remained constant when adjusted for grade, socioeconomic level, race, private or public school, and type of community.

- In a 1986 study, Wang and Walberg (cited in Wang & Zollers, 1990) conducted a large-scale observational study of eight widely implemented instructional programs, all of them adaptive to individual student needs including ALEM. Findings indicated that programs and classrooms featuring the greatest use of adaptive instruction practices were associated with academic and social outcomes that are linked to effective instructional and classroom management practices in the

effective teaching and school effectiveness literature. In addition, programs and classrooms that had the greatest use of strategies for individualizing instruction, including clear delineation of task-specific directions, had high levels of student responsibility. Significant differences were found across the programs in math achievement but not in reading achievement in favor of those that used adaptive instruction practices--the ALEM was one of the three top programs in math achievement.

- Wang & Birch (1984), in a 1980-81 study, compared the incidence of desirable classroom processes under ALEM and non-ALEM classrooms. ALEM classrooms were found to have higher student-initiated teacher interactions, student-teacher instructional interactions, student-student instructional interactions, time on self-selected exploratory activities, and student time-on task.

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PROJECT RIDE

Developed by Great Falls Public Schools (MT);
Ray Beck, Project Director

Project RIDE is a multi-faceted program that provides a series of interventions designed to meet the individual needs of each elementary and secondary student. RIDE is based on the belief that every student belongs to the whole school and should be considered the responsibility of the entire building staff. RIDE is a support system that uses Effective Teaching Practices, School-Wide Assistance Teams (SWATs), a computerized Tactics Bank, and Video Library.

RIDE is a staff development program designed to assist teachers in accommodating individual differences as close to the regular classroom as possible. It is a building based support system which operates on the premise that teachers, when coupled with proven classroom practices and modern technology, can become their own best resource. There are separate versions of Project RIDE for elementary and secondary students, both with the same purposes and goals. Project RIDE was developed by the Great Falls Public Schools of Great Falls, Montana and is distributed by Sopris West, Inc., of Longmont, Colorado.

Project RIDE utilizes research literature on proven classroom practices. The approach is one of cooperation and collaboration between special and general education teachers (Beck & Weast, 1989). The Effective Teaching Practices is based on an extensive literature review. The 364 tactics in the Tactics Bank and Video Library were taken from refereed journals and professional texts (Beck & Weast, 1989, p.4). The School-Wide Assistance Team is modeled directly after the Teacher Assistance Team (TAT) created by James Chalfant and Margaret Psych.

Project RIDE is based on twelve themes (Beck & Gabriel, 1989):

- Instruction is guided by pre-planned curriculum in which learning goals and objectives are developed and prioritized, sequenced to facilitate student learning, and organized or grouped into units or lessons.

- High expectations are established for student learning.

- Students are carefully oriented to lessons by teachers that help students get ready to learn.

- Instruction is clear and focused; with lesson activities reviewed, clear written verbal directions given, key points and instructions repeated, and student understanding checked.

- Learning progress is closely monitored requiring students to be accountable for their academic work.

- When student don't understand, they are retaught by teachers.

- Class time is used for learning with little time on non-learning activities.

- There are smooth, efficient classroom routines with minimal class disruptions.

- Instructional groups fit instructional needs with whole-group instruction when teachers introduce new concepts and skills.

- Standards for classroom behavior are explicit--with teachings letting students know that there are high standards for behavior in the classroom.

- Personal interactions between teachers and students are positive and teachers let student know they care about them.

- Incentives and rewards for students are used to promote excellence--some reward presented publicly, some immediately presented, and others delayed to teach persistence.

Major Findings

- Project Ride reduced the number of referrals to special education (referral rate was more than cut in half by the program).

- Project RIDE decreased the number of inappropriate referrals made to special education by an average of 54% to an average of 21%.

- Project RIDE produced a cost savings to the school district.

- Project RIDE helped to bridge the gap between special and general education.

- Project RIDE helped to create an atmosphere that all kids belong to the building and as such are part of an educational family.

- Project RIDE enhanced a team approach to serving all children.

- Project RIDE reduced feelings of isolation by many teachers who had to deal with difficult problems without adequate resources and support.

The Research

- Beck (1991) has reported that all of the 360 plus tactics included in the RIDE program were taken directly from research reported in refereed professional journals. Each tactic had been thoroughly evaluated, found to be effective, and met the vigorous standards of the journal.

- Over the past 10-12 years, Teacher Assistance Teams, on which School-Wide Assistance Teams (TATs) are modeled, have been widely implemented in school districts across the nation (Chalfant, 1984; Hayek, 1987). As with SWAT, evaluation of TAT on student outcomes has been based solely on teacher judgement. Chalfant and Pysh (1981) reported am 88.7 percent teacher-reported success rate for students without disabilities, and Gilmer (1985, as cited by Chalfant & Psych) reported a 72 percent success rate. Talley (1988, as cited by Chalfant & Psych) reported a 65 percent drop in the number of inappropriate referrals to special education.

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CLASSROOM GROUPING SCHEMES

Restructuring the classroom environment has produced significant effects on student learning. These approaches are in contrast to the more global educational policies that guide instruction or the specific teaching methodS used between teacher and student. A visitor to a classroom would easily notice the presence of these intervention strategies.

This review deals with four attempts at improving the education of special needs students through varying the organization of the classroom Environment:

Peer and Cross-age Tutoring
Cooperative Learning
Ability Grouping
Reducing Class Size

PEER AND CROSS-AGE TUTORING

Peer and cross-age tutoring operate on the principle that one-on-one instruction will increase students' performance in academic areas and improve students' social skills and behavior more than whole- or small group instruction. Its effects have been extensively studied by researchers at the University of Washington (Jenkins & Jenkins, 1987) and the University of Virginia (Lloyd, Crowley, Kohler, and Strain, 1988).

Peer and cross-age tutoring are classroom interventions in which students are paired for the purpose of providing tutorial instruction in academic and nonacademic areas. There is a variety of peer-mediated interventions which may be used separately or in combination with one another.

The four major types of peer-mediated interventions include:

Sharing Reinforcement: Peers participate, using group reinforcement procedures.

Peer Management--Nonacademic: Peers are taught to prompt the non-academic behaviors of a target child and deliver consequences for them. Peers are referred to as peer-managers.

Peer Tutoring--Academic: Peers provide instructions, consequences, and feedback contingent on academic behaviors.

Peer Modeling: Peers demonstrate appropriate responses to a target child.

Major Findings

In reviews of the literature conducted by Jenkins & Jenkins (1987) and Lloyd et al. (1988), following are major findings on the effects of peer tutoring:

- Peer tutoring procedures have a positive effect on increasing the academic achievement of mildly academically handicapped students.
- Positive effects on students' social relations with peers have been shown for emotionally handicapped students.

- When coupled with cooperative learning, peer teaching has had positive effects on social interaction with peers. When compared to reducing class size, peer teaching has been found to be more effective in improving students' academic achievement.

- Peer tutoring is most effective when tutors have a highly structured And carefully proscribed lesson format.

The Research

Not all studies in this area have included special education students, and those that have, have not consistently differentiated between types of students involved in the intervention. A sampler of the more recent investigations that have focused on elementary-aged students includes with disabilities:

Peer Mediation Studies Improving Academic Performance

1. Interdependent group contingencies were found to have a positive effect on the number of lessons completed during a daily reading lesson of 12 children in an EMR classroom (VanHouton and VanHouton, 1977).

2. Interdependent group contingencies were found to have a positive effect on the correct computation of math problems of 12 children in an LD classroom (Speltz, Shimamura, and Reynolds, 1982).

3. Interdependent group contingencies were found to have a positive effect on scores on weekly spelling tests of six LD resource room students (Delquadri, Greenwood, Stretton and Hall, 1983).

4. Interdependent group contingencies were found to have a positive effect on four math subtests of the CTBS on 63 academically handicapped students who received special education services each day (Slavin, Madden, and Leavey, 1984).

Peer Mediation Studies Improving Social Performance

1. Interdependent group contingencies were found to have a positive effect on positive social interactions with peers. The study included emotionally handicapped students who exhibited aggression and an inability to get along with peers (Gamble & Strain, 1979).

2. Social initiations and prompts from peer managers were found to have positive effects on different types of social interaction with peers. The study included children enrolled in a special education classroom for low-functioning autistic children (Strain, Kerr and Ragland, 1979).

3. Combining dependent and interdependent group contingencies were found to have a positive effect on sociometric status and various types of social interaction with peers. The study included three socially withdrawn boys, with IQs ranging from 75 to 80, who were integrated into a regular fourth grade classroom (Strain, 1981).

4. Dependent group contingencies and social initiations from peer managers were found to have positive effects on various forms of positive social interaction with peers. The study included nine students who engaged in low rates of social interaction with peers (Paine, Hops, Walker, Greenwood, Fleishman, and Guild, 1982).

5. Dependent group contingencies and prompts, approval, and points from peer managers were found to have positive effects on various forms of positive social interaction with peers at recess time. The study included three students who were integrated into a regular first grade class who received special education services 30 minutes each day (Fowler, Dougherty, Kirby, and Kohler, 1986).

Quality of the Research

Reviews of the research on peer-tutoring interventions have produced much controversy as to the generalizability of the results. Specifically, the research is limited in its ability to indicate what benefits accrue to peers who participate in the instruction of their classmates. In addition, the research is unable to predict how peer-mediated procedures function over extended time periods, such as an entire school year, nor is it able to conclude, with certainty, what types of skills or behaviors are more or less effectively taught by peers. Nevertheless, the consistently positive effects of peer-mediated interventions with special education students do suggest optimism about the utility of the approach in serving this population of students.

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COOPERATIVE LEARNING

Cooperative learning strategies operate on the age-old principle of social psychology that people working together toward a common goal can achieve more than individuals working separately. Its effects have been extensively studied by researchers at the University of Minnesota (Johnson & Johnson, 1986), the Johns Hopkins University (Madden & Slavin, 1983), and the University of Virginia (Lloyd, Crowley, Kohler & Strain, 1988).

Cooperative learning strategies are characterized by students working together, typically in groups of two to six, on lessons assigned by the teacher. They are tested individually, but are rewarded based on the accomplishments of the group as a whole.

Effective use of cooperative learning strategies involves four basic elements:

- Positive Interdependence: The students' feeling that they are linked with others and cannot succeed unless the others do;
- Individualized Accountability: Each student's performance is assessed individually and the group knows who is in need of more help and each member feels the responsibility to help so that the group can be successful;
- Collaborative Skills: In order to achieve the group's goals, each member must demonstrate leadership, decision-making, trust-building, communication and conflict management skills;
- Group Processing: Time is allotted to discuss how well the group is achieving the goals and maintaining effective working relationships among members.

Major Findings

- In reviews of the literature conducted by Lloyd et al. (1988) and Madden and Slavin (1983), the major findings on the effects of cooperative learning include:
- Cooperative learning strategies have consistently produced desirable effects on students' social behavior.

- Positive effects on students' social relations with each other have been shown for all students involved, specifically including special ration students.

- Significant effects of cooperative learning on students' academic skills have not been consistently shown.

- When coupled with individualized instruction, cooperative learning has improved students' achievement.

The Research

Not all studies in this area have included special education students, and those that have not consistently separated the effects on these students form those on students in the regular classroom. A sampler of the more recent investigations includes:

1. Student pairs that included learning-disabled boys showed less desirable social behavior than those that contained only regular education students. No such difference was found for LD girls. This study contrasted cooperative and individualized learning strategies among 100 nondisabled and 38 learning-disabled boys and girls in grades two through eight (Cosden, Pearl, & Bryan, 1985).

2. Greater acceptance of handicapped students was demonstrated in study which contrasted two variations of cooperative learning strategies with individualized learning. Students in the cooperative controversy setting said they would choose their handicapped peers to sit by them more frequently than their peers in the cooperative debate or individualized learning groups. The study included 27 handicapped and 45 nonhandicapped sixth grade students (Johnson, Johnson, Warring and Maruyama, 1986, experiment 1).

3. Greater acceptance of handicapped students was demonstrated in study which contrasted intergroup cooperation with intergroup competition. Students in the cooperative group more frequently said they would chose handicapped peers to sit by them than students in the competitive group in structured, unstructured, and out-of-class situations. The study included 15 handicapped and 36 nonhandicapped fourth grade students (Johnson, Johnson, Warring, and Maruyama, 1986 experiment 2).

4. Increased social acceptance of handicapped students was demonstrated in a study which contrasted cooperative learning with individualized learning. Students in the cooperative setting produced less social rejection of

handicapped students; however, handicapped students fared no better on academic or self-esteem measures under different conditions. The study included 40 low-performing and 143 nonhandicapped students in grades three, four, and six (Madden and Slavin, 1983).

5. Increased social acceptance of students in a cooperative TAI (cooperative learning with individualized instruction) setting was demonstrated in a study which contrasted cooperative TAI with both individualized learning and a control group receiving neither treatment. Students in the cooperative TAI setting were rated higher by teachers on behavior and self-confidence than those in the other groups. Results were not separated for handicapped versus nonhandicapped. The study included 30 handicapped and 474 non-handicapped students in grades three, four, and five (Slavin, Leavy, and Madden, 1984; experiment 1).

6. Increased mathematics achievement, self-confidence, and ability to form friendships of students in a cooperative TAI setting was demonstrated in a study that contrasted cooperative TAI with no treatment condition. Results were not separated for handicapped versus nonhandicapped. The study included 15 academically handicapped and 360 nonhandicapped students in grades four, five, and six. (Slavin, Leavey, and Madden, 1984; experiment 2).

7. Increased social acceptance of students in a cooperative TAI setting was demonstrated in a study which contrasted cooperative TAI with both individualized learning and a control group receiving neither treatment. Students in the cooperative TAI setting were rated higher by teachers on behavior and self-confidence than those in the other groups. The study included 117 academically handicapped and 387 nonhandicapped students in grades three, four, and five (Slavin, Madden, and Leavey, 1984a).

8. Increased mathematics achievement of students in a cooperative TAI setting was demonstrated in a study which contrasted cooperative TAI with no treatment. Students in the cooperative TAI setting had a greater number of correct mathematics computations and had learned more concepts than students in the control group. The study included 113 handicapped students and 1,258 nonhandicapped students in grades three, four, and five (Slavin, Madden, and Leavy, 1984b).

The Research

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Quality of the Research

Reviews of the research on Cooperative Learning have produced much controversy as to the generalizability of the results. Many of the studies cited above have been conducted in experimental settings, and their applicability to the mainstreamed regular classroom environment is questioned by some researchers (e.g., Lloyd, et al., 1988). Others are concerned with the need for longer-term follow-ups of the effects of these experiences and to study the collateral and unanticipated outcomes of these strategies. In

general, however, the consistently positive effects on the social behavior and interrelationships among students are cause for optimism as benefits of Cooperative Learning approaches for handicapped students. Corresponding effects on the academic progress of students with mild learning problems is not in as clear evidence, however.

ABILITY GROUPING

Ability grouping is one of the oldest and most controversial issues in educational psychology. There are several different types of ability grouping.

- **Ability Grouped Class Assignment** - Students are assigned on the basis of ability or achievement to one self-contained class, usually at the elementary level, or to one class which moves together from teacher to teacher, as in block scheduling in junior high schools.

- **Curriculum Tracking** - This is a special form of ability grouped class assignment unique to the secondary level (curriculum tracking) in which students are assigned by ability or achievement to tracks, such as college preparatory, general, or vocational. Students may take all courses within their track or they may have some heterogeneously grouped classes.

- **Regrouping for Reading or Mathematics (Ability Grouping for Selected Subjects)** - Students are assigned to heterogeneous homeroom classes for part or most of the day, but are "regrouped" according to achievement level for one or more subjects.

- **Joplin Plan** - A special form of regrouping for reading is the Joplin Plan (Floyd, 1954), in which students are assigned to heterogeneous classes most of the day but are regrouped for reading across grade lines. For example, a reading class at the fifth grade, first semester reading level might include high-achieving fourth graders, average achieving fifth graders, and low-achieving sixth graders. Reading group assignments are frequently reviewed so that students may be reassigned to a different reading class if the performance warrants it. The Joplin Plan was principally an innovation of the late 1950s and early 1960s, after which time interest in cross-grade grouping turned more toward nongraded plans.

- **Nongraded Plans** - The term "nongraded" or "ungraded" refers to a variety of related grouping plans. In its original conception (Goodlad and Anderson, 1963), nongraded programs are ones in which grade-level designations are entirely removed, and students are placed in flexible groups according to their performance

level, not their age. Full-scale nongraded plans might use team teaching, individualized instruction, learning centers, and other means of accommodating student differences in all academic subjects. Students in nongraded programs might complete the primary cycle (grades 1-3) in two years, or may take four years to do so. The curriculum in each subject may be divided into levels (e.g., nine or twelve levels for the primary grades) through which students progress at their own rates, picking up each year where they left off the previous year. This "continuous progress" aspect of nongrading give students a feeling that they are always moving forward; for example, rather than being assigned to the low reading group each year, a low achieving student simply progresses from level to level at a slower rate.

- **Special Classes for High Achievers** - Gifted and talented students may be assigned to a special class for part or all of their school day, while other students remain in heterogeneous classes.

- **Special Classes for Low Achievers** - Students with learning problems may be assigned to special or remedial classes for part or all of their school day.

- **Within-Class Ability Grouping** - The most common form of within-class grouping is the use of reading groups, where teachers assign students to one of a small number of groups (usually three) on the basis of reading or mathematics level. These groups work on different materials at different rates based on student needs and abilities. Another common form of within-class ability grouping in elementary mathematics is one where the teacher presents a lesson to the class as a whole, and afterwards, while the students are working problems, the teacher provides enrichment or extension to a high-achieving group, remediation, or re-explanation to low achievers, and something in between to average achievers.

  Group-paced master learning (Bloom, 1976) is one form of flexible within-class ability grouping. Students are grouped after each lesson into "masters" and "non-masters" groups on the basis of a formative test. Non-masters receive corrective instruction while masters do enrichment activities.

- **Ability Grouping of One** - Individualized or continuous-progress instruction may be seen as extreme forms of ability grouping, as each student may be in a unique ability group" of one.

Theoretical Advances and Disadvantages of Ability Grouping

Ability grouping is supposed to increase student achievement primarily by reducing the heterogeneity of the class or instructional group, making it more possible for the teacher to provide instruction that is neither too easy nor too hard for most students. Ability grouping allows the teacher to increase the pace and level of instruction for high achievers and provide more individual attention, repetition, and review for low achievers. It provides a spur to high achievers by making them work harder to succeed, and to allow success to low achievers by protecting them from having to compete with more able age mates (Atkinson & O'Connor, 1963).

The arguments against ability grouping relate to the fact that this practice creates classes or groups of low achievers in which students are deprived of the example and stimulation provided by high achievers. Being labeled and assigned to a low group communicates low expectations for students which may be self-fulfilling (Good & Marshall, 1984; Persell, 1977). Homogeneously low performing reading groups have also been observed to experience a slower pace and lower quality of instruction than do students in higher achieving groups (Allington, 1980; Barr, 1975). A lack of appropriately behaving models may lead to "behavioral contagion" among homogeneously grouped low achievers (Felmlee & Eder, 1983), so these groups may spend less time on task than other groups.

A compelling argument against ability grouping is that it goes against the democratic ideals by creating academic elites (Persell, 1977; Rosenbaum, 1976; Sorensen, 1970). This argument indicates that all students need opportunities to interact with a wide range of peers. Ability groupings often parallel social class and ethnic groupings by disproportionately placing low SES, Black, and Hispanic students in low tracks (Rist, 1970; Haller & Davis, 1980; Heyns, 1974). The use of ability grouping may increase divisions along class, race, and ethnic group lines (Rosenbaum, 1980).

Major Findings

- There are hundreds of studies that examine the effects of various forms of between-class ability grouping (e.g., tracking, streaming) and within-class ability grouping (e.g., reading, math groups).

- Almost without exceptions reviews from the 1920's to the present have come to the same general conclusion that between-class ability grouping has few if any benefits for student achievement.

- Meta-analyses on ability grouping in elementary (C.L. Kulik and J. Kulik, 1984) and in secondary schools (Kulik & Kulik, 1982) have found small positive achievement

effects of between-class ability grouping, with high achievers gaining the most from the practice.

- When limiting the review of studies to methodologically adequate studies of comprehensive ability grouping at the elementary level and different types of ability grouping are reviewed separately, the results are surprisingly clear cut for most types of grouping. The best evidence from randomized and matched equivalent studies unequivocally supports the positive achievement effects of the use of within-class ability grouping in mathematics and of Joplin and nongraded plans in reading.

- In contrast, there is no support for the practice of assigning students to self-contained classes according to general ability or performance level.

- Evidence on the effects of regrouping within grade levels for reading and mathematics is unclear, and there is no methodologically adequate evidence concerning the use of reading groups.

- Research indicates that there are good reasons to avoid ability grouped class assignments, which seem to have the greatest potential for negative social effects since it entirely separates students into different streams.

- Reviewers indicate that we must understand more about how various ability grouping plans have their effects.

The Research

Slavin (1986) reviewed a total of fourteen studies of comprehensive ability grouped class assignment plans. These are summarized in Table 1. A summary of these studies would suggest that the research evidence unequivocally refutes the assertion that ability grouped class assignment can increase student achievement in elementary schools. There is considerable number of good quality research to support this finding.

Studies of special programs for the gifted tend to find achievement benefits for the gifted students (J. Kulkik and C.L. Kulik, 1984; Passow, 11979). Studies of mainstreaming vs. pullout special education programs for students with learning problems tend to favor regular class placement (Madden & Slavin, 1983). However, it is important to note that characteristics of special accelerated programs for the gifted programs can account for the effects of gifted programs, not the fact of separate grouping per se (Fox, 1979). Also, selection bias problems in non-randomized studies of programs for the gifted and for students with learning problems can bias the results of these studies toward higher placements (Borg, 1965; Slavin, 1984a).

In many elementary schools, reading and/or mathematics is scheduled at the same time for all students in a particular grade, at which time students leave their heterogeneous homeroom classes to receive reading or mathematics instruction in a class that is more homogeneous in the skills in question. Slavin (1986) found that there is neither the number nor the quality of studies of regrouping to provide definite conclusions concerning their effectiveness. Overall, the results of studies of regrouping for reading and mathematics are inconclusive.; e.g., studies are equivocal.

REDUCING CLASS SIZE

Class size is the number of students in any given classroom or the ratio of students to teacher. The impact of class size has been a major issue among both practitioners and researchers for over two decades. Research in the area has determined that efficient class sizes are the product of many variables, including grade level, subject area, nature of students in the classroom, nature of learning objectives, availability of materials and facilities, instructional methods and procedures used, skills and attitudes of the teacher and support staff, and budgetary constraints. Hence class size cannot be treated as a condition independent of other class characteristics. Efforts to synthesize the vast research pertaining to the effects of class size on the teaching-learning process have been made by researchers at the University of Colorado (Glass and Smith, 1978) and the Educational Research Service in Arlington, Virginia (Robinson and Wittebols, 1986).

Major Findings

Major findings from analyses of the research on class size conducted by Glass and Smith (1978) and Robinson and Wittebols (1986) include:

- Significant effects of class size on student learning occur for students in the primary grades.
- Smaller class size has the greatest effect on the teaching of reading.
- Low-performing students achieve more in smaller classes.
- Smaller classes produce more positive student attitudes and behavior.
- There is no "optimum" class size covering all types of students, in all subject areas, and at all grade levels.
- Smaller classes will not, in and of themselves, result in greater achievement for students.

The Research

Attempts to synthesize the vast research on the effects of class size have utilized a method called meta analysis (e.g., Glass and Smith, 1978) or an approach called related cluster analysis for decision making (e.g., Robinson and Wittebols, 1986). The former is a re-analysis of research conducted on class size and the latter is an approach that summarizes and analyzes research findings as they relate to specific problem areas and issues of concern when making class size decisions.

Class Size and Grade Levels

1. The grades that show the most promising effects of small classes on student learning are the early primary grades K-3; a slight positive effect can be found in grades 4-8; and no positive effect can be found in grades 9-12.

2. For grades 1-3 and 4-8 the most beneficial effects are noted when class size is 22 students or less.

Class Size and Content Area

1. The most beneficial effects of smaller classes are noted in the area of reading, followed, in descending order, by mathematics, language arts, and natural sciences.

Class Size and Academic Ability of Students

1. Students of lesser academic ability achieve more in smaller classes.

Class Size and Disadvantaged or Ethnic Students

1. Students who are economically disadvantaged or from an ethnic minority achieve more academically in smaller classes.

Instructional Methods and Learning Interventions

1. While class size does have a positive relationship to achievement, other factors appear more important such as reinforcement, acceleration, cues, and feedback/correctives.

2. Peer tutoring has been found to be over four times as effective in improving students' mathematical and reading achievement than reducing class size from 35 to 20.

Class Size and Student Behavior

1. Improved student behavior and attitudes are related to smaller class size.

Cost Implications of Class Size

1. In the early primary grades, there is no evidence that additional funds used to reduce class size can be more cost-effective in improving student achievement than the same funds spent to hire teachers with additional college training or years of teaching experience.

2. At the early primary level, the use of peer tutors can be more cost-effective in increasing student achievement than reducing class size.

3. In grades 3-5, there is evidence that using additional funds to reduce class size is less cost-effective in improving student achievement than allocating the same funds to improve the training of teachers.

4. In the secondary grades, there is no research evidence that reducing class size within reasonable ranges is cost-effective in improving student achievement.

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TEACHING METHODS AND PRACTICES

The "how" and "what" of teaching are often driven by local instructional policies. Resultant practices may reflect a particular philosophy about what should be taught and/or a body of research that has determined the efficacy of a particular instructional approach. The teaching practices are targeted for a specific outcome such as increasing the social interaction between students with and without disabilities or increasing low-performing students' rates of comprehension of written material.

This review deals with three different teaching methods and practices:

Reciprocal Teaching
Social Skills Training
Study Skills Training
Instructional Reinforcement
Learning Styles
Effective Teaching
Mastery Learning

RECIPROCAL TEACHING

Reciprocal teaching is a one-on-one reading comprehension intervention in which a teacher models summarizing, questioning, clarifying, and predicting. The teacher guides a student to participate at an increasing level of competence.

Reciprocal teaching is a modeling technique used to teach reading comprehension skills. This method allows a great deal of student-teacher interaction. Initially the teacher and student take turns leading a dialogue concerning parts of a story. Then the teacher models comprehension activities, and the student is taught to reciprocate with the same activities. The teacher interacts with the students providing guidance and feedback. Dialogue between the student and teacher is structured to incorporate four strategies: **generating questions** about the content, **summarizing** the content, **clarifying** points, and **predicting** upcoming content from cues in the text or from prior knowledge of the topic. These four activities represent the kinds of strategic engagement experienced by successful readers (Bereiter and Bird, 1985).

Following are the principles that form the theoretical basis for reciprocal teaching Palincsar, Ransom, and Derber, 1989):

1. The aim of reciprocal teaching is to construct the meaning of the text and to monitor comprehension.
2. The acquisition of the strategies is a joint responsibility shared by the teacher and the students. The teacher initially assumes major responsibility for teaching these strategies but gradually transfers responsibility to the students for demonstrating their use.
3. All students are expected to participate in the discussions; the teacher encourages each student by providing prompts or altering the demand on the student.
4. The teacher makes conscious attempts every day to release control of the dialogue to the students.

Major Findings

Training students in comprehension skills using reciprocal teaching techniques produced the following effects:

- Students made sizable improvements in standardized comprehension scores.

- Low-performing students increased in general thinking skills and the ability to dialogue about what was read.

- A number of factors have supported the gains made by reciprocal teaching groups--teacher-peer collaboration, alignment of instructional objectives with assessment, and an array of incentives.

Caution

- The research base is small because reciprocal teaching is a recent intervention.

The Research

- In a study using reciprocal teaching, over 90 percent of the experimental students met success criteria following 20 consecutive days of instruction (gains on criterion-referenced measures of comprehension, as well as improvement on measures taken in social studies and science classes (Brown and Palincsar, 1982; Palincsar and Brown, 1984).

- In the initial studies, reciprocal teaching was compared with more traditional approaches to comprehension that would rule out explanations of the improvement in terms of practice, time-on-task, and teacher attention. Studies by Brown and Palincsar, 1987 and Palincsar, 1985 concluded that students in the explicit teaching instruction in which the teacher modeled the strategies demonstrated made significant gains, but their gains were exceed by the students in the reciprocal teaching group.

- A study conducted by Paslincsar, Brown, and Samsel, 1989, in the Springfield, Illinois Public Schools found that 72 percent of the 71 students in the experimental reciprocal teaching group demonstrated statistically significant gains, compared to 20 percent of the 76 students in the control group.

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SOCIAL SKILLS TRAINING

Social Skills Training is designed to give students with mild handicaps skills to interact and form friendships in more heterogeneous settings.

In recent years, the fields of special education and psychology have actively pursued the study of teaching pro-social behavior to children and adolescents. A variety of research studies have been conducted and curriculum programs developed.

Difference methods of social skills training include:

- Coaching: The teacher works one-on-one with students using direct instructional techniques to teach well-defined social skills.
- Modeling: Students are taught through guided examples.
- Counseling: Students participate in individual and/or group counseling to learn improved social skills.
- Direct Reinforcement: Teacher reinforcement of appropriate student behavior.
- Group Contingencies: Students are rewarded on the basis of the social behavior of the entire class or of groups within the class
- Cognitive Behavior Modification: Students are taught to bring target behaviors under their control.

During the past several years, several validated social skills curricula have been published to teach alternative or replacement social skills. One of the critical components of these programs is that they specifically program for the generalization/transfer of newly learned social skills across settings and conditions in the student's environment. One program that has been designed for administrator is called **Administrative Intervention** developed by staff at Boys Town, Nebraska. This program gives the principal another intervention choice for students sent to the office for disruptive class behavior. The program centers on four steps beginning with de-escalating the disruptive behavior, obtaining,

and maintaining instructional control, teaching alternative social behavior and preparing the student for classroom re-entry.

A second program for special educators and support personnel is found in a manual called **Aggression Replacement Training (ART)**. This program is a comprehensive intervention for aggressive youth, authored by A. R. Goldstein & B. Glick and published by Research Press, 1987. ART is for aggressive adolescent students and consists of three coordinated interventions. The first component is structured learning for building appropriate social skills. This component centers on modeling, role playing, performance feedback, and transfer training. Anger control training is the second component and teaches the student how to inhibit or control antisocial behavior. The third component is moral education and centers on the work of Hoklberg and the use of moral dilemmas in a discussion group context. The program focuses on a social, affective and cognitive training across a ten week period with groups of 6-12.

A third social skills training program is ACCESS (Adolescent Curriculum for Communication and Effective Social Skills) by Walter & Associates, ProEd, 1987. This social skills training program is for adolescents. It follows a direct instruction and problem solving approach, as does the Walker ACCEPTS program for elementary age students (Research Press). ACCESS is designed to teach 31 social skills and includes a teacher's guide, a student study guide and situational role play cards. Other field tested social skills training programs include Connie Dembrosky's program, "Affective Skill Development for Adolescents", ASSET Social Skills Program, Achieving Social Competency, Utah State University, elementary and secondary); and Let's Be Social, Utah State University (Preschool).

Major Findings

- Coaching and modeling have been found to increase rates of positive peer interaction and to reduce rates of negative peer interaction among poorly accepted students.

- Counseling peer-rejected students has improved their acceptance by classmates (more than informal teacher guidance).

- Reinforcement by teachers and group contingencies have consistently increased appropriate social behaviors of withdrawn students.

- Social skills instruction and training is more effective with heterogenous groups of students, including those with and without disabilities.

- Students must be provided with many learning opportunities

during initial social skills instruction.

- Social skills instruction must be extended into the home and community.

- Students must be trained to self-evaluate and self-monitor their social skills performance.

- The most effective means of teaching social skills is through a direct instructional format.

The Research

- One major concern of research in this area is whether or not the training that students receive in special education or counseling settings will transfer or generalize to nontraining settings. Relatively few research studies have demonstrated generalized results or maintenance of the newly learned social behavior over time. Even fewer articles have demonstrated any major change in the students' social status with his peers as a function of social skills training. While many studies have suggested that social skills training is effective in helping socially deficient students become socially competent, the final results are not in.

- In spite of the mixed results of experimental studies, there are some important correlational research studies that provide support for the continuation of social skills training in the schools. Hymall and Asher (1977) estimated that 6-115 of all elementary students in grades three through six report having no friends in school. In 1981, Asher and Renshaw reported that 5-15% of all elementary students have significant interpersonal problems. A number of correlationship studies tend to support the position that dropping out of high school, committing suicide, being seen in mental health clinics or receiving psychiatric assistance, experiencing character disorders or problems of juvenile delinquency, school maladjustment problems, and alcohol and drug abuse have all been found to highly correlate with social incompetence. These problems are compounded in students with disabilities. Many student with disabilities do not develop appropriate social skills. For these students, social skills instruction is important if they are to have an opportunity to make friends and get along with others.

- A study conducted by Young, West, and Smith (1984) demonstrated that teaching social skills with groups made up of both disabled and nondisabled students increased the effectiveness of the training. All students benefit from social skills instruction, even those who already have the basic social skills being taught. Having socially competent,

as well as socially deficient, students in the same group provides social validity or social acceptability for social skills instruction. Students with disabilities do not feel that they are being singled out for additional special instruction. As the more socially competent students become aware that these social skills are valued and expected by teachers, they are more likely to exhibit these social skills. The more socially competent students also provide appropriate models for the use of social skills. Finally, students without disabilities prompt the students with disabilities in an appropriate, socially acceptable manner to use their social skills.

- Research has indicated that as with all instruction, it is essential that students have the opportunity to respond and practice new skills if they are going to become competent and fluent in the use of the skills--particularly with newly learned social skills. They must practice correct responses with many learning opportunities. Such practice may initially come through role play activities, but eventually they must be prompted and encouraged to occur in the natural environment. Without programmed learning opportunities, many students will not use the social skills in the natural environment and will not completely integrate the social behavior into their own interpersonal interactions.

- Cheney (1986) demonstrated that disabled and nondisabled secondary-aged students can effectively provide social skills instruction and were more likely to maintain their social skills and transfer their use to nontraining settings if peers were involved in the social skills instruction. Young, West, and Smith (1984) also reported that the involvement of socially competent peers greatly increased the generalized use of skills to nontraining settings. Young, Ahanonu, and Macfarlane (1984) found that nondisabled students could be effective social skills trainers with children with moderate to severe disabilities and that their involvement with these children spread to their friends and other students in their school classes. The research literature in general indicates that peer involvement in social skills training is highly effective and does promote generalized use of the skills.

- Young, West, and Smith (1984) also found that parental involvement is an effective strategy in generalizing the use of social skills to the home and the community.

- Jenne, Young, West, and Morgan (1986) found that where conversation skills were taught to shy, withdrawn adolescents, the social skills training was effective, but the students did not use their newly learning conversational skills outside of the training setting. These authors then tried to extent the effects of social skills training by using a self-management

strategy. Students were taught to monitor, self-evaluate, and record their conversational behavior. With the addition of this self-evaluation strategy, students increased their use of social skills in different settings.

- A number of research studies have indicated that the most effective means of teaching social skills is through a direct instructional format (Cheney, Young & Morgan; Young, Peterson, Morgan, & Jenson). Teaching students specific skills and providing practice opportunities designed to develop fluent use of the skills increases the probability that the students' behavior will change.

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STUDY SKILLS TRAINING

Study skills training is designed to enhance students' school behaviors, organizational skills, strategies for responding in class and use of textbooks and other reference materials

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Study skills training can improve student skills in four specific study processes:

> Identifying the study task: Analyzing what they have to study and how to choose the appropriate strategy for the task.
>
> Specifying the material to be studied: Knowing the properties of texts that affect learning, how to identify these properties, and how to use these properties.
>
> Relying on student characteristics: Understanding the role of their own motivation, ability, and background knowledge in the subject being studied.
>
> Using Study Strategies: Applying knowledge of why, when, and how to use particular study skills.

One example of a study skills training is a program developed by Lake Washington School District, Lake Washington, Washington State, **Skills for School Success**. (Linda Jenkins, Principal). This program has five strands in various grade levels. In the first strand, students are introduced to critical school behaviors that need to occur before school, during school, and after school (homework). In the second strand, students are taught important organization skills: how to organize and maintain a notebook, how to organize any set of materials, how to record assignments on an assignment calendar, and how to organize the content on their papers. The curriculum is spiral, skills that are introduced at one grade level are reviewed at each subsequent grade level with more difficult examples. At each grade level, additional skills are also introduced.

In the next strand, students are taught specific learning strategies that allow them to respond in class and gain information. The strategies are gradually introduced until all of them have been taught in the sixth grade level. Many of the strategies assist students in completing classroom assignments.

For example, they are introduced to strategies for completing assignments, for answering chapter questions, and for proofing papers. Students are also taught a series of skills for preparing for and taking tests. At the foundation of the test preparation segment of the program, students are taught a strategy for memorizing or studying something carefully. They also learn procedures for preparing for different tests and a strategy for taking tests. In this strand, students are also introduced to strategies to assist them in carefully reading a textbook.

In the fourth strand, students are taught how to gain information from their textbooks. They are introduced to the use of the table of contents, glossary, and index. In addition, fourth through sixth graders are taught how to read and interpret a variety of graphs. The final strand of the program focuses on common classroom reference materials. Students are introduced to the use of the dictionary including how to quickly locate entries in the dictionary and how to read entries. students are also given practice in locating and reading encyclopedia.

Major Findings

- Students learning to learn from their reading is critical.
- Students who can already study effectively are not helped by training in study skills.
- Each content area has its own types of tasks, materials, and strategies for study. Hence, content area teachers should incorporate their own study skills training into their classroom instruction.
- A caution: Traditional study skills, e.j., underlining, taking notes, writing summaries, and asking questions, are not techniques that help students do better on all kinds of tests.

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INSTRUCTIONAL REINFORCEMENT

Instructional reinforcement is defined as the provision of verbal, symbolic, tangible or other rewards for desirable academic performance or effort at the classroom level, including praise, symbolic rewards, token rewards, tangible rewards, and activity rewards.

BACKGROUND: CHANGING VIEWS OF REINFORCEMENT

The use of instructional reinforcement began with the proliferation of theories and experimental work in the area of behavior modification in the 1950s and 1960s. A number of studies have been undertaken and many theories have been advanced regarding the use of reinforcement to manage animal and human behavior.

While there was early enthusiasm regarding the applications of behavior modification techniques, most educators and psychologists now believe that the applications of behavior modification were oversold. For example, behavior modification theorists showed little restraint in generalizing findings from animal studies to human behavior. In addition, many behavior modification techniques was determined to be unfeasible in their use in educational settings.

There was a backlash in the use of behavior modification in the late 1960s and early 1970s. Many educators began to express strong criticisms of the use of reinforcement techniques in educational settings. Some argued that providing social and material reinforcements gives students the wrong message about learning. In addition, these extrinsic payoffs can communicate that the learning activities are not worthwhile in themselves. Others claim that providing reinforcements undermines intrinsic motivation and that whatever achievement gains result from using them are lost once reinforcement is withdrawn.

The classroom management and effective schooling research of the 1970s and 1980s also helped to clarify the uses and effects of instructional reinforcement and to resolve some of the issues raised by its critics.

There a large research base regarding the impact of the following types of instructional reinforcement:

- **Praise (and other verbal reinforcement)** - correct responses during class discussions, accurate homework, improved test scores, etc.

- **Symbolic rewards** - gold starts, having one's picture on a bulletin board or name in a newsletter, etc.

- **Token rewards** - points or chips, which are valueless in themselves, but which can be redeemed for things of value.

- **Tangible rewards** - edibles, toys, or school-related items (pencils, notebooks, etc.).

- **Activity rewards** - free time, being leader of an activity, going on a field trip, etc.

Dr. Jere Brophy, professor at Michigan State University's Institute for Research on Teaching, has conducted an extensive investigation of the various kinds of teacher praise and their effects. He has prepared the following guidelines for classroom use:

Guidelines for Effective Praise (Excerpted from J.E. Brophy, "Teacher Praise: A Functional Analysis." Review of Educational Research 51 (1981), p. 26.

Effective Praise

1. Is delivered contingently
2. Specifies the particulars of the accomplishment
3. Shows spontaneity, and other signs of credibility; suggests clear attention to the student's accomplishment
4. Rewards attainment of specified performance criteria (which can include effort criteria, however)
5. Provides information to students about their competence or the value of their accomplishments
6. Orients students towards better appreciation of their own task-related behavior and thinking about problem solving
7. Uses students' own prior accomplishments as the context for describing present accomplishments
8. Is given in recognition of noteworthy effort or success at difficult (for this student) tasks
9. Attributes success to effort and ability, implying that similar successes can be expected in the future
10. Fosters endogenous attributes (students believe that they expend the task and/or want to develop task-relevant skills)
11. Focuses students' attention on their own relevant behavior
12. Fosters appreciation of and desirable attributions about task relevant behavior after the process is completed

Ineffective Praise

1. Is delivered randomly or unsystematically

2. Is restricted to global positive reactions
3. Shows a bland uniformity, which suggests a conditioned response made with minimal attention
4. Rewards mere participation, without consideration of performance processes or outcomes
5. Provides no information at all or gives students information about their own status
6. Orients students toward comparing themselves with others and thinking about competing
7. Uses the accomplishments of peers as the context for describing students' present accomplishments
8. Is given without regard to the effort expended or the meaning of the accomplishment (to this student)
9. Attributes success to ability alone or to external factors such as luck or easy task
10. Fosters exogenous attributions (students believe that they expend effort on the task for external reasons--to please the teacher, win a competition or reward, etc.)
11. Focuses students' attention on the teacher as an external authority figure who is manipulating them
12. Intrudes into the ongoing process, distracting attention from task relevant behavior

The Research

The Northwest Regional Educational Laboratory examined 37 documents on different kinds of instructional reinforcement and their effects. Twenty-five were reports of research studies, and twelve were review/synthesis documents. Twenty documents involved elementary level students; five, secondary; and twelve, the entire elementary-secondary range.

What does the research say about the effects of reinforcement in general on students' academic achievement?

- Contingent reinforcement is positively related to achievement.

- Noncontingent reinforcement is unrelated to achievement in most cases; however, there is evidence that low-ability and younger (primary) children receive some academic benefit from noncontingent, socially motivated praise.

- Acknowledging correct responses as such is positively related to achievement.

- Reinforcements are most effective when clearly linked to students' progress toward goals.

- Achievement benefits accrue at the same rate whether students only receive rewards for correct answers, or both receive rewards for correct answers and lose them for incorrect answers ("response cost").

- Instructional reinforcement alone produces achievement benefits equal to those produced by a combination of instructional and behavioral reinforcement.

What does the research say about the effects of praise on students' academic performance?

- Teacher praise does not necessarily reinforce learning, nor is it always intended to do so. Various other reasons, such as a desire to fill students' emotional needs or manage their behavior, frequently motivate praise.

- Praise can enhance learning if it is contingent, specific, sincere, and credible.

- Teachers whose students achieve most are sparing rather than effusive in praising correct answers.

- Greater achievement gains are noted when praise is delivered privately than when it is given in public.

- Greater achievement gains occur when the interactions in which praise is given are initiated by teachers rather than by students.

- When students are praised for their present progress relative to past performance, greater achievement gains result than when they are praised relative to the performance of their classmates.

- Noncontingent praise is negatively related to achievement for high-ability students.

- Praising students who answer correctly in class discussions is often intrusive and distracting, and may even embarrass the recipient.

- When correct responses are acknowledged as such ("Yes," "Correct," "That's right") achievement benefits result.

- Basic feedback involves telling students if their response is correct and, if incorrect, supplying the correct answer. *Elaborated corrective feedback* involves providing students who have answered incorrectly with a series of rules or prompts that will enable them to arrive at the correct answer. Both kinds of feedback produce greater achievement gains than no feedback, and elaborated corrective feedback produces greater gains than basic feedback.

What does the research say about the relative effectiveness of different reinforcement methods?

- Contingent, verbal reinforcement is more effective than other methods for older students.

- Whether immediate or delayed reinforcement is more effective is mainly a matter of the developmental level of the recipient. Young children respond best to immediate reinforcement, while older students respond equally well to immediate and delayed reinforcement.

Do student characteristics influence the effectiveness of different kinds of reinforcement?

- Noncontingent social reinforcement and praise are positively related to achievement for primary-age students, low-ability students, and many students from low SES backgrounds.

- Students with an external locus of control (those who believe that their actions are determined more by outside events and other people than by themselves) perform better with tangible reinforcement than with verbal reinforcement or with no reinforcement.

- Internal locus of control students perform equally well with different kinds of reinforcers.

What are the effects of group reward structures on achievement?

- When students are reinforced and rewarded for group academic performance, their achievement is equal to that of students reinforced for their individual academic performance.

- In addition to the achievement benefits of cooperative reward structures, students have also demonstrated increases on measures of mutual concern and positive race relations.

What are other effects of reinforcement?

- When students are reinforced (by any means) for learning achievement, their on task behavior increases and disruptions are minimized.
- A combination of reinforcement and corrective feedback is positively related to positive attitudes toward learning, toward particular subject areas, and toward teachers.
- Contingent reinforcement is positively associated with increases on measures of self-efficacy (internal locus of control).
- The behavioral improvements noted in response to reinforcing students for learning achievements tend to persist after the removal of the reinforcers.

What are the effects of punishing learning failures?

- o The incidence of criticism in classrooms, as noted by researchers in observational studies, is quite low.
- o Criticism can be positively related to achievement for high-ability students if it is contingent, specific, and relatively infrequent.
- o For students generally, criticism is unrelated to achievement.
- o Response cost structures alone are unrelated to achievement; a combination of reinforcement and response cost is positively related to achievement.

What are the negative effects of reinforcement?

- o Reinforcers of all kinds can contribute to intrinsic motivation if they are salient to the task at hand.
- o Reinforcement does not undermine intrinsic motivation when the recipient perceives it as a symbol of success rather than an attempt to control his or her behavior.
- o Intrinsic motivation can be undermined if students are rewarded for participation only.
- o Decreases in performance quality and in intrinsic motivation following the withdrawal of reinforcement are most like]y when the reinforcement has the following characteristics:
  - High salience (large or highly attractive rewards, or rewards presented in ways that call attention to them)
  - Noncontingency
  - Unnatural or unusual qualities, such as being artificially tied to behaviors rather than being natural outcomes of the behaviors

Can achievement be raised by providing training in reinforcement techniques to teachers and tutors?

- o Teachers trained in the provision of verbal feedback which acknowledges correct responses and helps students answering incorrectly to arrive at correct responses have higher achieving students than those who do not receive such training
- o Providing training to student tutors in how to deliver specific, contingent verbal reinforcement is positively related to student achievement.

What are the findings involving reinforcement and one or more variables?

- o When achievement is reinforced, achievement and behavior (on-task, nondisruptive) both improve; when appropriate behavior is reinforced, behavior improves, but achievement is unaffected.

- o Students rewarded for simply participating achieve less than those reinforced for accurate responses and no better than

those who are not rewarded at all.

The Research

Barringer, C., and Gholson, B. "Effects of Type and Combination of Feedback upon Conceptual Learning by Children: Implications for Research in Academic Learning." *Review of Educational Research* 49, (1979):459-478.

Reviews research that compared the effects of different kinds of feedback (verbal, symbolic, tangible) and feedback combinations on student's learning. Symbolic or verbal feedback had more powerful effects than tangible rewards.

Bear, G. C., and Richards, H. C. "An Interdependent Group-Oriented Contingency System for Improving Academic Performance." *School Psychology Review* 9(1980):190-193.

Investigates the effects of group contingencies (extra minutes of recess time) on the English and math achievement of students in grades 5 through 8. Subjects improved their achievement significantly over the baseline period.

Brophy, J. E. "Teacher Behavior and Its Effects." *Journal of Educational Psychology* 71(1979):733-750.

Discusses findings of process-product research conducted during the 1970s; also discusses methodologies used in this research and presents research trends and recommendations for research activities in the future. Includes a section on the effects of teacher praise.

"Teacher Praise: A Functional Analysis." *Review of Educational Research* 51 (1981): 5-32.

Reviews classroom process research on teachers' verbal praise and its effects. Differentiates among different kinds of praise and offers recommendations to teachers.

____, and Evertson, C. M. *Learning from Teaching: A Developmental Perspective*. Boston, MA: Allyn and Bacon, 1976.

Reports findings from the Texas Teacher Effectiveness Study on the effects of the behavior and expectations of second and third grade teachers on the achievement and attitude of their students. Focuses on teachers' classroom management, questioning patterns and use of motivational techniques in high and low SES classrooms.

, and Good, T. L. "Teacher Behavior and Student Achievement." In *Handbook of Research on Teaching,* edited by M. C. Wittrock. New York: Macmillan Publishing company 1986.

linking teacher behavior to student achievement. Includes a section on teacher praise and other verbal reinforcement.

Broughton, S. F. *Effects and Noneffects of Reinforcement for Academic Performance*. Paper presented at the Meeting of the Midwestern Association of Behavior Analysis, Chicago, IL, May 1978. (ED 186 794).

Investigates the effects on math achievement and on-task behavior of fourth graders when verbal reinforcement was provided for correct completion of math problems. Reinforced students significantly outperformed controls.

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Compares the effects on achievement and behavior of three positive reinforcement conditions and a control group. Treatment students outperformed controls but did not differ from one another

Cannella, G. S. "Praise and Concrete Rewards: Concerns for Childhood Education." *Childhood Education* 62 (1986):297-301.

Reviews and summarizes findings on the effects of social and concrete rewards on the achievement of elementary students. Guidelines for teachers are offered.

Centra, J. A., and Potter, D. A. "School and Teacher Effects: An International Model." *Review of Educational Research* 50 (1980): 273-291.

Offers a model for investigating school and teacher variables which influence student achievement. Reviews studies of variables and outcomes. Presents findings on reinforcement.

Clingman, J.; Auerbach, S. M.; Bowman, P. C.; and Parrish, J. M. Un-differential Effects of Candy, Social and Token Rewards on the IQ Scores of Children of Above Average Intelligence." *Psychology in the Schools 14* (1977):95-98.

Compared the effects on IQ score of rewarding correct responses with a variety of reinforcers. Only token rewards with material back-ups were significantly related to positive IQ change.

Collins, M.; Carnine, D.; and Gersten, R. "Elaborated Corrective Feedback and the Acquisition of Reasoning Skills: A Study of Computer-Assisted Instruction." *Exceptional Children* (1986), (in press).

Studies the relative effects of basic feedback and elaborated

feedback on the development of reasoning skills by special education and Chapter 1 students learning via CAI. Students receiving elaborated feedback outperformed the comparison group.

Conrad, E. E. *The Effects of Tutor Achievement Level, Reinforcement Training and Expectancy on Peer Tutoring*. Tuscon, AZ: Center for Educational Research and Development, Arizona University, 1975. (ED 116 807)

Investigates the effects on first graders' achievement of tutors' achievement level, training tutors in reinforcement and corrective feedback procedures, and tutor expectations. Training of tutors was significantly related to achievement; other elements were unrelated.

Dickinson, D. J. "But What Happens When You Take That Reinforcement Away?" *Psychology in the Schools* 11(1974):158160.

Investigates the effects on junior high students' achievement and behavior when effective, achievement-enhancing token rewards (with material and privilege back-ups) were withdrawn. Reinforced students continued to outperform controls two years after the withdrawal of reinforcement.

Gettinger, M. "Student Behaviors, Teacher Reinforcement, Student Ability, and Learning." *Contemporary Educational Psychology* 8 (1983): 391-402.

The effects of (1) verbal reinforcement of on-task behavior, (2) verbal reinforcement of accurate responses and (3) tangible reinforcers (tokens or edibles) for both on task behavior and accurate responses were investigated. Verbal reinforcement of accurate responses was positively and significantly related to achievement. Other treatments were unrelated.

Good, T. L., and Brophy, J. E. *Looking in Classrooms* (3rd ed.). New York: Harper and Row, 1984.

Discusses teacher behaviors and their influence on students. Provides guidelines for implementing effective classroom management practices. Contains section on reinforcement.

High and Low SES Classroom Teacher Behaviors. *Journal of Teacher Education* 29 (1978): 85-90.

Compares the effects of a variety of teacher behaviors on high and low SES classes. Differential effects of praise noted for high and low SES students.

Gregory, M.K. Effects of Locus of Control and Type of Reinforcement on Programmed Instruction Performance of Adolescent Boys." *Journal of Educational Research* 70 (1979): 45-49.

The effects of three conditions on the achievement of boys determined to have an internal locus of control were compared with the effects of those conditions on boys found to have an external locus of control. The three conditions were no feedback, confirmations of correct response and monetary reward for correct response. Internals performed equally well in all conditions. Externals performed best with tangible reinforcers.

Griswold, P. A., and Arnold, M. R. "Rate and Accuracy of Vowel Recognition as a Function of Spoken Reinforcers and Age." *Journal of School Psychology* 18 (1980): *256-262*

Examines the effects of praise and corrective reinforcers on the achievement of urban, low SES males in grades 1-3, 6-7 and 11-12. The effectiveness of praise was found to decrease with grade level, while the effectiveness of corrective reinforcers increased with grade level.

Harrop, A., and McCann, C. "Behavior Modification and Reading Attainment in the Comprehensive School." *Educational Research* 25 (1983): 191-195.

Examines the effects on achievement of promising students that a letter of commendation would be sent to their parents if they showed "good" progress in English comprehension. Experimental subjects significantly outperformed controls on standardized tests.

Hundert, J.; Bucher, B.; and Henderson, M. "Increasing Appropriate Classroom Behavior and Academic Performance by Reinforcing Correct Work Alone." *Psychology in the Schools* 13 (1976):194-200.

Investigates the effects on academic achievement and classroom behavior of providing tokens (which could be redeemed for toys) for appropriate behavior and correct work. Subjects were boys 9-12 in a psychiatric hospital. When rewarded for appropriate behavior, behavior improved but achievement did not change. When rewarded for achievement, both achievement and behavior improved.

Hymel, G. M., and Mathews, G. S. "Effects of a Mastery Approach on Social Studies Achievement and Unit Evaluation." *Southern Journal of Educational Research* 14 (1980): 191-204.

Examines the relative effects of no feedback, general feedback, and specific feedback on the social studies achievement of secondary students and their evaluation of the units studied. Those receiving specific feedback outperformed those receiving general feedback, who, in turn, outperformed those in the nofeedback condition.

Kennelly, K J., and Mount, S. A. "Perceived Contingency of

Reinforcements, Helplessness, Locus of Control, and Academic Performance." *Psychology in the Schools* 22(1985):465-469.

Studies the relationships among students' perceptions of the contingency of teacher administered reinforcements, teachers' perceptions of student helplessness or competence, student locus of control measures, and student achievement. Various relationships were noted.

Lysakowski, R. S., and Walberg, H. J. "Classroom Reinforcement in Relation to Learning: A Qualitative Synthesis." *Journal of Educational Research* 75 (1981): 69-77.

Analyzes statistical data from 39 studies involving nearly 5000 students in over 200 classes to determine relationships between reinforcement and achievement. Found that the effects of reinforcement were positive and were constant across grades, races, private and public schools, students, and community types.

Morgan, M. "Reward-Induced Decrements and Increments in Intrinsic Motivation.n *Review of Educational Research* 54 (1984): 5-30.

Reviews studies on the relationship between providing rewards and students' subsequent motivation. Many kinds of rewards and situations in which they are provided are outlined. Some unclear findings, but it appears that intrinsic motivation is *not* undermined when the recipient perceives the reward as a "symbol of success" rather than an attempt to control his or her behavior.

Saigh, P. A. "The Validity of the WISC-R Examiner Verbal Praise Procedure as a Concurrent Predictor of the Academic Achievement of Intellectually Superior Students." *Journal of Clinical Psychology* 37(1981):647-649.

Investigates the effects of noncontingent praise on the achievement of high-IQ, high-achieving students. Control students were given neutral comments instead of praise. The experimental students' achievement was not enhanced by the noncontingent praise. In fact, their achievement was slightly lower than that of control.

Rosenfeld, G. W. "Some Effects of Reinforcement on Achievement and Behavior in a Regular Classroom." *Journal of Educational Psychology* 63 (1972):189-193.

Studies the effects of different kinds of reinforcement on the achievement of high-, middle- and low-IQ sixth grade students. Different effects noted for different students. Improvements did not deteriorate when reinforcements were withdrawn.

Schunk, D. H. "Enhancing Self-Efficacy and Achievement through Rewards and Goals: Motivational and Informational Effects." *Journal of Educational Research* 78 (1984):29-34.

Investigates the effects of performance contingent rewards and proximal goals on children's task motivation, self-efficacy and task performance. The condition of rewards and proximal goals produced greater achievement than either one alone

"Reward Contingencies and the Development of Children's Skills and Self Efficacy.'' *Journal of Educational Psychology* 75 (1983): 511-518.

Investigates the effects on elementary students' arithmetic achievement and self efficacy of three conditions: performance contingent rewards, rewards for participation, and no rewards. Children in the performance-contingent treatment (points which could be changed for praise such as marking pens, stickers, small notebooks) significantly outperformed other students and had greater self-efficacy perceptions. Rewards-for-participation students performed no better than no-reward students and their sense of self-efficacy was no greater.

Slavin, R. E. *Educational Psychology: Theory into Practice.* Englewood Cliffs, NJ: Prentice-Hall, 1986.

Presents concepts and practices from the field of educational psychology, accompanied by numerous real-life example- and commentary from teachers.

Effects of Individual Learning Expectations on Student Achievement, Report No. 288. Baltimore, MD: Center for Social Organization of Schools, Johns Hopkins University, 1979. (ED 189118)

Compares the performance of students who had the opportunity to earn Plus points" toward having their names published in a weekly newsletter with the performance of control students. Treatment students significantly outperformed controls.

_____, "Students Motivating Students to Excel: Cooperative Incentives, Cooperative Tasks, and Student Achievement." *The Elementary School Journal* 85 (1984): 53-63.

Reviews 46 studies on cooperative learning and cooperative rewards. The majority of studies showed cooperative learning to have significantly positive effects on student achievement. The most positive effects were noted when students were in structures with both cooperative tasks and cooperative rewards.

Taffel, S. J., and O'Leary. K D. "Reinforcing Math with More Math: Choosing Special Academic Activities as a Reward for Academic Performance." *Journal of Educational Psychology* 68 (1976): 579587.

Investigated the effects on math achievement of providing special

math activities as a reward for completion of initial math activities. All experimental children performed better than controls, but there were no significant differences among treatment groups.

Taylor, C., and White, K R. Effects of Reinforcement and Training on Title I Students' Group standardized Test Performance." Paper presented at the Annual Meeting of the American Educational Research Association, Los Angeles, CA: April 1981. (E D 206 655).

Examines the effects of reinforcement, teacher training in test administration, and student training in test taking procedure- on the standardized reading test performance of elementary students.

Walberg, H. J. Improving the Productivity of America's Schools." *Educational Leadership* 41(8) (1984): 19-27.

Synthesizes the findings from approximately 3000 studies to determine the relative effect sizes of over forty factors, including student aptitude levels, instructional practices, and environmental factors. Found that the largest effects were produced by reinforcement.

Walker, H.M., and Hops, H. Increasing Academic Achievement by Reinforcing Direct Academic Performance and/or Facilitative Nonacademic Responses." *Journal of Educational Psychology, 68* (1976): 218-225.

LEARNING STYLES

The purpose of the Learning Styles Model (LSM) is to improve the effectiveness of instruction through the identification and matching of individual learning styles with appropriate instructional procedures and materials. The major focus for change is the organization of the classroom that are made to accommodate a variety of learning preferences. The LSM is based on the assumption that it is possible to identify individual student preferences for learning environments and modify the environment to match the preferences.

The Learning Styles Model (LSM) is an individualized instructional process that matches learning style preferences with instructional procedures and materials. The classroom organization and climate is changed from the traditional classroom with instructional rows of desks to a flexible classroom organization that offers aprocedures and materials. Specific classroom changes reflect the conditions of learning which allow each student to process information effectively such as lighting, temperature, noise, sociological factors that involve working alone or in groups, personal motivational characteristics such as the ability to independently complete assignments, and psychological considerations that involve how the student approaches learning.

The LSM has been successfully used at all grade levels although the process for identification of learning styles is more reliable at older age levels. Thus, instruction based on learning styles has been implemented more extensively at the secondary level. The LSM developed out of the public school classroom experiences of Dr. Rita Dunn, Professor at Hunter College. In 1979, St. John's University established the Center for the Study of Learning and Teaching Styles, under the leadership of Dr. Dunn, to provide research, inservice training, and public service information about learning styles. The National Association of Secondary School Principals and St. John's University have co-sponsored the Learning Styles Network. The LSM traces its roots to two distinct theories of learning: brain lateralization theory and cognitive style theory. The brain lateralization theory emerged from the early work of Paul Braco ,a French neurologist. This work demonstrated that left hemispheric brain activity is associated with verbal and analytical abilities, while right brain activity is associated with emotions and spatial and holistic thinking abilities. Cognitive

style theory postulates that individual learners process information differently based on either learned or inherent characteristics.

Curry (1987) reviewed the cognitive/learning styles literature and determined that three distinct concepts or "sub-constructs" have been combined to form the construct of learning styles: instructional preference, information processing style, and cognitive personality style.

Following are several general principles that the LSM is based on:

- All individuals can learn.
- The learning conditions in which different individuals learn best will vary.
- Individual learning preferences exist and can be reliably measured.
- Students are self-motivated to learn when they have the option of using their learning preferences.
- All teachers can learn to use learning styles as a basis for instruction.

There are also several instructional principles associated with the implementation of the LSM program:

- Formal procedures for identifying individual learning styles are established and followed.
- Each classroom is organized in a flexible manner to provide a variety of simultaneous individual and group instructional activities.
- Students monitor their own progress and are responsible for their own achievement.
- An instructional system is employed that includes instructional objectives, frequent progress monitoring, and progress feedback to students.

The use of the LSM involves two main groups of activities: the diagnosis and identification of individual learning styles and the planning and implementation of instruction to accommodate individual student's learning style strengths (Dunn, Dunn, and Price, 1985). At the diagnostic stage of the program, individual strengths and weaknesses across a set of learning style elements are identified. These elements are presented are grouped into five stimuli categories: environmental, emotional, sociological, physical, and psychological. Preferences that are related to the classroom environmental characteristics are:

- **Sound Preference.** When concentrating on learning tasks, does the student prefer silence when studying, or varying degrees and/or types of noise, such as music or talking?
- **Light Preferences.** During learning tasks some individuals

perform differently in soft light as compared to bright lights. Does the student have a clear preference for a particular level of light?

- **Temperature Preferences.** Does the student prefer a warm, rather than cool classroom when concentrating on mental tasks?

- **Design Preferences.** Some students prefer a formal and traditional desk and chair arrangement of the classroom furniture while others prefer an informal learning atmosphere that includes a flexible arrangement of the furniture and different types of furniture, such as soft reclining chairs, carpets and pillows on the floor.

Preferences that relate to the emotional and personality characteristics of the student are called "Motivation Preferences". This set of preferences focuses on determining the main source of the student's motivation for learning. Three main motivation sources are intrinsic and self motivation, peer oriented motivation, and adult/teacher oriented motivation. The motivation preferences are:

- **Persistence Preferences.** Persistence refers to the student's attention span in relation to staying on task. Does the student prefer to work for long periods of time on one task, or does he/she prefer frequent breaks or variations in the learning task?

- **Responsibility Preferences.** Does the student prefer to follow through independently on assignments with little supervision, guidance or feedback from the teacher or does he/she prefer frequent teacher guidance and supervision?

- **Structure Preferences.** This element addresses the amount of learning task structure preferred by the student on a continuum from extensive structure to very little structure.

Instructional preferences that are associated with interpersonal and sociological characteristics are called "Self Preferences" and address the question: When working on a learning task does the student prefer to work alone in an independent fashion? The four preferences in this set are:

- **Pair Preferences.** When working on a learning task, does the student prefer to work with one other student?

- **Peer Preference.** When working on a learning task, does the student prefer to work in a cooperative group with five or six other students?

- **Teacher Preference.** Does the student prefer working on a

learning talk with a teacher?

- **Varied Preference.** Does the student prefer to work on a learning task in a variety of groupings as well as with the teacher?

The following instructional preferences are associated with the individual student's biological or physical nature and address the question: Does the student prefer instructional procedures that primarily use (a) a visual modality, (b) an auditory modality, (c) a tactual modality, (d) a kinesthetic modality, or (e) multisensory modality?

- **Intake Preferences.** Does the student prefer to be eating or drinking while she or he is working on a learning task?

- **Time Preferences.** Does the student prefer to concentrate on a learning task in the (a) early morning, (b) late morning, (c) early afternoon, (d) late afternoon, or (e) evening?

- **Mobility Preferences.** When working on a learning task, does the student prefer to physically change positions or move around the room?

The psychological elements are concerned with the cognitive processing style of the student and are designated as the "Global or Analytic Style." These elements relate to the question: Does the student prefer to work on a learning task by breaking the task into sequential chunks of information to learn and then reviewing the total task (sequential learning), or does he/she prefer to develop an overall understanding of the task before learning the details (simultaneous learning)? The preferences associated with the Global or analytic style are:

- **Hemisphericity Preferences.** Does the pattern of instructional preferences of the student suggest a right brain or a left brain dominance?

- **Impulsive or Reflective Style.** Does the student prefer to come to conclusions and make decisions quickly or does she/he prefer to spend time thinking about the content involved before making a decision or taking action?

Several instruments have been developed to measure learning styles and preference. The most prominent of these instruments is the Learning Styles Inventory developed by Dunn, Dunn, and Price (1985). Once students' learning styles are identified, instructional environments are arranged to match individual learning style strengths. The primary focus during this stage is on restructuring the classroom organization to facilitate effective instruction. The classroom's physical setting, including room arrangement, pupil grouping, and procedures used for instruction,

are varied to match individual learners' learning styles.

A wide variety of instructional procedures and materials should be used to simultaneously provide an array of learning situations that match student learning styles.

Students must have opportunities for individual and small group learning. By individualizing instruction for some students, teachers are able to respond to specific learning style differences among students. Individualized instruction allows for self-pacing, gearing academic content to student ability level, independence, and attention to individual student interests. The developers, in their book, **Teaching Students Through Their Individual Learning Styles A Practical Approach** (Dunn & Dunn, 1978), describe three techniques for addressing a variety of learning styles through individualized instruction. These techniques are Contract Activity Packages, Programmed Learning Sequences, and Multisensory Instructional Packages.

Contract Activity Packages (CAPs) are individualized educational plans that contain:

- Simply stated objectives that itemize exactly what the student is required to learn.
- Multisensory resources that teach the information that the objectives indicate must be mastered.
- A series of activities through which the information that has been mastered is used in a creative way.
- A series of alternative ways in which creative activities developed by one student may be shared with one or more classmates.
- Inclusion of small-group learning techniques.
- A pretest, a self-test, and a post-test.

Dunn & Dunn (1978) provide directions that teachers can use for developing CAPs, or teachers may order developed CAPs from the Learning Styles Network (address provided at the end of this summary).

Programmed Learning Sequences (PLSs) are a form of programmed instruction that present topics to students in a logical, easy-to-follow sequence. PLSs have the following basic programmed instruction characteristics:

- Only one task is presented at a time.
- The student is required to be an active, rather than a

passive, learner.

- The student is immediately informed of the correctness of each response.
- Students may not continue into the next phase of a program until each previous phase has been understood and mastered.
- The student is exposed to material that gradually progresses from the easy to the more difficult.
- As the student proceeds in the program, fewer hints and crutches are provided.

The success of the LSM depends on the teacher's ability to plan and develop the appropriate learning activities for students to select from. In addition to individual learning opportunities, teachers must provide opportunities for small group learning. Teachers are encouraged to employ a variety of small group activities. All learning activities should be developed to address the auditory, visual, tactual, and kinesthetic learning styles of students.

Major Findings

- Students perform significantly higher on academic tasks as a result of the use of the LSM.
- When children are taught with multisensory resources, but initially through their most preferred modality and then reinforced through their secondary modality, scores have increased even more.
- Studies that have looked at students' sociological preferences and teaching in multiple treatments responsive to their learning styles have found that students achieved significantly higher when instructional conditions were matched.

The Research

There have been extensive numbers of effectiveness on the LSM. These studies are categorized across specific groups of learning style preferences, such as the environmental elements or the sociological elements. Although the studies have been conducted at all grade levels and across various groups of students, the majority of the studies cited have been conducted at the secondary level and have focused on students who are low academic performers.

Studies investigating sound preferences (DeGregoris, 1986); mobility preferences (Miller, 1981; DellaValle, 11984); formality/informality preferences (Hodges, 1985; Stiles, 1985; Shea, 1983); lighting preferences (Krimsky, 1982); and intake preferences (MacMurren, 1985) have all reported a significant

impact on academic performance when students' preferences for a specific element were considered during instruction.

Eight studies have found that when students were taught with instructional resources that both matched and mismatched their preferred perceptual modalities (visual, tactile, and auditory), they achieved statistically higher test scores in modality-matched treatments. When children were taught with multisensory resources, but initially through their most preferred modality and then were reinforced through their secondary modality, scores increased even more (Martini, 1986; Kroon, 1985; Javonbeck, 1984; Wheller, 1983; Weinberg, 1983; Carbo, 1980; Urbschat, 1977).

A review of five studies in which students' sociological preferences (learning alone, with peers, in teams, with adults, etc.) were identified and the students were taught in multiple treatments that were responsive and unresponsive to their diagnosed learning styles was done by Giannitti, 1988 and Miles, 1987. They found in four of these studies, students achieved significantly higher when instructional conditions were matched.

A number of studies have indicated that the LSM has contributed to increased achievement and higher levels of satisfaction (Carbo, 1988; Curry, 1987).

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instruction. **Dissertation Abstracts International**, 44, 2039A.

MASTERY LEARNING

Mastery learning is based on the belief that all children can learn and that success breeds success. Mastery learning is a teacher-directed instructional program. It is an instructional method designed to ensure successful attainment of academic skills and knowledge by all students.

The purpose of Mastery Learning is to help teachers teach more effectively and to help students learn more efficiently. It focuses primarily on academic learning outcomes, and can be used to teach the full range of knowledge and skill outcomes found in the general education curriculum.

Mastery Learning is based on the following beliefs and principles:

- All children can and will learn well.
- Teachers can help students learn.
- Students learn more when they know what it is and that they are expected to learn.
- Whatever is worth learning is worth learning well.
- Curriculum is better managed when it is organized into units of instruction.
- Students learn better when the curriculum is structured.
- Students can be taught to transfer and apply what they learn.
- Teaching is most effective when learners possess the pre-requisite skills.
- Re-teaching is more effective when it differs from the original instruction.
- Affective characteristics are most positively affected by ensuring that students experience frequent success on academic tasks.

Mastery learning curriculum is organized in instructional units, and an instructional plan is developed for each unit. The plan includes unit and lesson objectives, prerequisites for learning the new content, materials and activities, time allocations, formative tests, and cut-off scores to determine mastery. Each new instructional unit begins with a teacher's regularly planned instruction that is supplemented with additional instruction when necessary. Teachers monitor student performance daily to determine when students are ready to take formative tests. Based on their performance on the formative tests, students who have met or exceeded the mastery criterion as assigned to enrichment

activities. Those students who fail to achieve the criterion are assigned to corrective instruction. Mastery learning emphasizes success and the prevention of failure.

The conceptual basis of mastery learning comes from John B. Carroll's Model of School Learning (Bloom, 1974). In this model, the basic thesis is that time is a central variable in school learning and that students differ in the amount of time they need to learn a given unit of learning to some set criterion. This model postulated that the "time needed to learn" is influenced by aptitude, ability to understand instruction, and quality of instruction. "Time spent learning" is influenced by opportunity and perseverance. Mastery learning proponents believe that classroom experiences, not the characteristics of learners, make the greatest difference in student achievement. Rather than using the traditional definition of aptitude as being "how much a person can learn,", Carrol defined it in terms of "how long it takes a person to learn. If the student were given the amount of time he needed, and if he persevered until he devoted this amount of time to the learning task, he would reach the criterion level of achievement.

Adoption of Carrol's model by Bloom meant that under mastery learning conditions, achievement could be fixed at some high level (all students would learning the expected content) and time spent on teaching content could vary, depending on the needs of individual students. In traditional classrooms, time spent on teaching the content is fixed, and achievement varies. This constitutes the major difference between Mastery Learning and conventional instruction.

Mastery learning contains two main components: curriculum organization and instructional procedures. During curriculum organization, teachers decide what it is that they want students to learn and what they want them to be able to do with what they learn. The expected learning outcomes are stated as unit objectives. A task analysis is conducted for each objective to determine their proper sequence and to identify prerequisite knowledge and skills. Next, the teacher determines the level to which objectives must be attained. This is referred to as "establishing the mastery level." After this is done, the teacher then decides how much time will be allocated to the instructional unit (which is usually between two and four weeks). Teachers also develop formative tests that are used in monitoring learning and instruction and in determining mastery of unit objectives. Summative tests are developed and used at the end of the grading period or semester and may provide the basis for grading.

The final organization activity for teachers is that of designing instruction. In this activity, course content is broken down into learning units that can generally be mastered by all students in about 2-4 weeks. All of the information about the unit is

contained in a "unit plan". The plan is completed before the unit of instruction is begun. The unit plan contains the unit and lesson objectives associated with mastery of the unit goals, identifies the prerequisite knowledge and skills, describes the materials and objectives to be used, specifies the time allocated for the unit, contains the formative tests, and specifies the mastery levels for these tests. The plan also describes the materials and activities to be used in enrichment instruction for those who master the objectives after the original instruction and in corrective instruction with those who fail to demonstrate mastery after the original instruction. All of the planning and development activities takes place before the instruction is delivered to students.

Each new instructional unit begins with original instruction that typically lasts 6 to 16 class periods. Teachers begin instruction by introducing the unit and focusing the students on the task(s) by informing them of exactly what they will learn, how they will show they have learned it, and why it is important for them to learn it. The teacher then presents the unit providing examples and guided practice. The teacher monitors students' academic work to prevent practice errors and to determine their readiness for formative assessment.

The original instruction is followed by the administration for a formative test to determine which students have and have not mastered the content. These tests may contain objective items, essay items, performance items, or a combination of these. Those students who attain the pre-established criterion level are certified as having mastered the content, and those who have not demonstrated mastery are provided corrective instruction (correctives) which is carried out in may different ways (e.g., in small groups or individually). Instruction is individualized only when necessary. Corrective instruction differs from the original instruction in several different ways--with different media, materials, and examples generally used in corrective instruction. The corrective instruction is customized to the needs of the learner. Students are re-taught the material until nearly all of them are able to demonstrate mastery. Those students who achieve mastery on the first formative tests serve as tutors or engage in enrichment activities or independent study. Time is provided for teachers to develop a depository of correctives, as well as enrichment activities, available when a new unit of instruction is begun. Existing instructional units, including the correctives and enrichment activities, must be revised continually and new units must be developed.

At the end of the instructional unit, the teacher administers a second formative tests. Summative tests are administered at the end of each grading period or semester. Summative tests, like formative tests, may contain objective items, essay items, performance items, or a combination of these.

Students know before an instructional unit begins what they are expected to learn and the level of achievement that constitutes mastery. Therefore, when they receive feedback on formative and summative tests, they know how their performance compares with the pre-determined standard of acceptable performance (mastery).

Implementation of the mastery learning program does not affect the number of staff members needed at a school. No special or additional facilities are needed to implement mastery learning. Mastery learning can be integrated into the existing curriculum, although teachers may find it necessary to organize the content differently so that the units to be taught progress in a manner consistent with desired student outcomes. No additional equipment, materials, or supplies are needed to implement mastery learning in a classroom, a school, or a school system. However, resources should be available for the additional material development that will be needed. The mastery learning classroom looks like most other classrooms. Perhaps the most noticeable difference may be the presence of a unit objectives posted in the classroom. Instruction is expected to be targeted at these objectives, and students are expected to be on task a very high percentage of the time.

Major Findings:

- Studies have consistently reported that student achievement is higher following the implementation of mastery learning.
- Studies examining the effects of mastery learning on student learning have reported gains in achievement in favor of mastery learning.
- Studies of retention and transfer all showed strong support for mastery learning. (Block and Burns, 1976; Guskey and Gates, 1985).
- Studies are inconclusive whether rate of learning increasing within mastery learning conditions.
- Mastery learning has a positive effect on self concept, self esteem, attitudes, and interests of students.

The Research:

Mastery learning has been implemented and evaluated in a wide range of subjects and grade levels in the United States and abroad. The program has been implemented and evaluated in small school districts such as John City, New York (Mamary, 1986) and Red Bank, New Jersey (Squires, Huitt, and Segars, 1983-1984); as well as large ones, such as Denver (Barbar, 1982) and Philadelphia (Conner, Hill, Kopple, Marshall, Scholnick, Schulman, and Sloan, 1986).

Cognitive and affective outcomes have been studied using a wide variety of research methodologies. A common approach to study the effects of mastery learning has been to compare before mastery learning student achievement with after-mastery learning achievement. These studies have consistently reported that student achievement is higher following the implementation of mastery learning.

One major review of the research on mastery learning examined its effects on variability in learning; ie., the difference between the high-achieving and low-achieving students (Block and Burns, 1976). Results indicated that mastery learning reduced the variability by approximately 50%. Learning rate is related to variability in learning. Mastery learning seeks to reduce variability among learners by bringing the slower ones up to the faster ones. Some studies report that the rate does increase under mastery learning conditions (Guskey and Gates, 1985), while others (Cronback and Snow, 1977; Arlin, 1982; and Cohen, 1983) question this finding.

Studies of the effect of mastery learning on student effect such as self-concept, self-esteem, attitudes, and interests have been conducted and, although they have methodological problems, the results nearly always favor mastery learning over the other instructional approaches (Block & Burns, 1976; Dolan, 1986; and Guskey & Gates, 1985). The book entitled, **Building Effective Mastery Learning Schools** by James Block, Helen Efthim, and Robert Burns (1989) is a comprehensive source of information about mastery learning.

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EFFECTING TEACHING PRACTICES

Effective teaching strategies are teaching practices which have been determined empirically to effect student achievement. Their effects on student achievement have been studied extensively by researchers at the University of Illinois at Urbana-Champaign (Rosenshine, 1983) and the University of Oregon (Becker, 1977), and the Institute for Research on Teaching at Michigan State University (Brophy, 1982).

Effective teaching strategies are teaching practices that have been shown to differentiate effective schools and teachers from ineffective ones. Direct instruction is one of the strategies found to be a strong predictor of student achievement. Direct instruction is an instructional pattern that stresses teacher directiveness, academic focus, and structured, sequential learning activities.

Effective teaching strategies include the following characteristics:

- A pre-planned curriculum
- High expectations for student learning
- Clear and focused instruction
- Close monitoring of learning progress
- Re-teaching of misunderstood skills and concepts
- Careful organization of class time
- Smooth, efficient classroom routines
- Instructional groups formed to fit instructional needs
- Explicit standards for classroom behavior
- Positive personal interactions between teachers and students
- Incentives and rewards used to promote excellence

Major Findings

In reviews of the research literature conducted by Rosenshine (1983) and Becker (1977), the major findings on the effects of effective teaching strategies include:

- Effective teaching strategies work with students who are younger, slower, and/or have little prior background, as well as with students who are older, more skilled

learners.

- Effective teaching practices have been found to be strong predictors of student achievement across academic and nonacademic programs.

- Research on effective teaching models has concluded that one method is basically as effective as another, as long as the important content is covered and the above listed components are involved. Direct instruction, one mastery learning model, involves quality teaching with carefully analyzed, logical, and clear instructional sequences in the form of scripted lessons, consistently delivered. Direct instruction has provided powerful empirical proof that virtually all children can learn.

The Research

Studies evaluating the effects of effective teaching strategies have included both special education and general education students. However, the separate effects for each group generally have not been reported. Following is a summary of the findings of these studies:

1. Students taught with structured curricula have been found to do better than those taught with more individualized discovery learning approaches (Venezky, 1979).

2. Students who receive their instruction directly from their teachers have been found to achieve more than those expected to learn new material or skills on their own or from each other (Becker. 1977).

3. To the extent that students are younger, slower and/or have little prior background, teachers have been found to be most effective when they employ the following teaching practices:

   a. Provide structured learning (Venezky, 1979);
   b. Proceed in small steps but at a brisk pace (Brophy, 1982);
   c. Give detailed and redundant instructions and explanations (Brophy, 1980);
   d. Provide many examples (Brophy, 1980);
   e. Ask a large number of questions and provide overt, active practice (Brophy, 1982);
   f. Provide feedback and corrections, particularly in the initial stages of learning new material (Anderson, 1979);
   g. Require a success of 80 percent or higher in initial learning (Fisher, Berliner, Filby, Marliave, Cohen, and Dishaw, 1980);
   h. Divide seatwork assignments into smaller assignments (Evertson, 1982); and
   i. Provide for continued student practice so that students have a success rate of 90-100 percent and become rapid, confident, and firm (Gersten, Carnine, and Williams, 1981).

4. Providing direct instruction in general learning skills has been found to be a reliable way to help students become more independent learners (Larkin and Reif, 1976).

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